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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,769	08/27/2003	Antti Kuurne	60091.00233	4047

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EXAMINER	
MILORD, MARCEAU	
ART UNIT	**PAPER NUMBER**
2618	

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/648,769	KUURNE ET AL.	
	Examiner	Art Unit	
	Marceau Milord	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Searle et al (US Patent No 5570098) in view of Aalto et al (US Patent No 6091955).

Regarding claims 1-4, Searle et al discloses an antenna adjustment method (figs. 4-5), comprising: gathering information on interference in predetermined radio cells (col. 3, lines 31-40;col. 6, lines 33-50); arranging the gathered information radio cell-specifically for processing (col. 4, lines 44-60); determining a tilting factor for at least one predetermined radio cell, wherein the tilting factor relates to the interference the radio cell produces to other cells (col. 7, lines 1-33; col. 11, line 38- col. 12, line 13).

However, Searle et al does not specifically disclose the features of searching for the radio cells having the antenna tilting factors that fulfill a predetermined criterion; and tilting the antennas of the searched radio cells; wherein the gathering step comprises gathering the

information on the interference, which comprises pilot-channel signal-strength measurement results measured by user terminals.

On the other hand, Aalto et al, from the same field of endeavor, discloses a cellular radio network and a method for increasing traffic carrying capacity in a cellular network in which the operating frequency spectrum of the cellular network has been divided so that typically both regular frequencies and super-reuse frequencies are employed in each cell. The regular frequencies use a conventional frequency reuse pattern to provide seamless overall coverage. A very tight frequency reuse pattern is used for the super-reuse frequencies to provide additional capacity (col. 3, lines 24-61; col. 4, lines 8-37). The cellular network controls the division of traffic into regular and super-reuse frequencies by radio resource allocation at the call set-up phase and later on during the call by handover procedure. The cellular network continuously monitors the downlink co-channel interference of each super-reuse frequency in the cell separately for each ongoing call. The call is handed over from a regular frequency to a super-reuse frequency when the co-channel interference level on the super-reuse frequency is sufficiently low. When the co-channel interference level on the super-reuse frequency deteriorates, the call is handed over from the super-reuse frequency back to the regular frequency (col. 7, lines 1-27; col. 8, lines 5-29; col. 9, line 54- col. 10, line 31). Furthermore, the BSC controls traffic division into regular and super-reuse frequencies by means of radio resource allocation at the call set-up phase and later on during the call by means of a handover. The BSC allocates a traffic channel to the call to be set up or to a call handed over from another regular cell at a regular TRX only, wherefore a regular cell must have at least one regular TRX, typically a BCCH TRX. The BSC monitors the downlink C/I ratio on each super-reuse frequency of the

regular cell separately for each ongoing call. The monitoring is accomplished in such a way that the BSC calculates the downlink C/I ratio of the super-reuse TRX by means of various parameters and by means of measurement results reported by the MS via the BTS. The BSC can calculate the C/I ratio on the super-reuse frequencies at the location of each active mobile station MS. The C/I can be calculated in this way; since the downlink transmits power is the same on the regular and super-reuse frequencies of the cell (col. 9, lines 21-37; col. 9, line 54- col. 10, line 31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Aalto to the communication system of Searle in order to improve frequency utilization in an under-overlay cellular radio network without increase in co-channel interference.

Regarding claim 5, Searle et al as modified discloses an antenna adjustment method (figs. 4-5), wherein the gathering step comprises gathering the gathered information, which is arranged in a matrix (col. 6, lines 14-21;col. 6, line 65-col. 7, line 16; col. 8, lines 40-52).

Claims 6-7, contain similar limitations addressed in claims 1-4, and therefore are rejected under a similar rationale.

Regarding claims 8-11, Searle et al discloses an antenna adjustment system (figs. 4-5), comprising: gathering means for gathering information on interference in predetermined radio cells (col. 3, lines 31-40;col. 6, lines 33-50); arranging means for arranging the gathered information radio cell-specifically for processing (col. 4, lines 44-60); determining means for determining a tilting factor for at least one predetermined radio cell, wherein the tilting factor relates to the interference that the radio cell produces to other cells (col. 7, lines 1-33; col. 11, line 38- col. 12, line 13).

However, Searle et al does not specifically disclose the features of searching means for searching for radio cells having the antenna tilting factors that fulfill a predetermined criterion; wherein the information on the interference comprises pilot-channel signal-strength measurement results measured by user terminals.

On the other hand, Aalto et al, from the same field of endeavor, discloses a cellular radio network and a method for increasing traffic carrying capacity in a cellular network in which the operating frequency spectrum of the cellular network has been divided so that typically both regular frequencies and super-reuse frequencies are employed in each cell. The regular frequencies use a conventional frequency reuse pattern to provide seamless overall coverage. A very tight frequency reuse pattern is used for the super-reuse frequencies to provide additional capacity (col. 3, lines 24-61; col. 4, lines 8-37). The cellular network controls the division of traffic into regular and super-reuse frequencies by radio resource allocation at the call set-up phase and later on during the call by handover procedure. The cellular network continuously monitors the downlink co-channel interference of each super-reuse frequency in the cell separately for each ongoing call. The call is handed over from a regular frequency to a super-reuse frequency when the co-channel interference level on the super-reuse frequency is sufficiently low. When the co-channel interference level on the super-reuse frequency deteriorates, the call is handed over from the super-reuse frequency back to the regular frequency (col. 7, lines 1-27; col. 8, lines 5-29; col. 9, line 54- col. 10, line 31). Furthermore, the BSC controls traffic division into regular and super-reuse frequencies by means of radio resource allocation at the call set-up phase and later on during the call by means of a handover. The BSC allocates a traffic channel to the call to be set up or to a call handed over from another regular

cell at a regular TRX only, wherefore a regular cell must have at least one regular TRX, typically a BCCH TRX. The BSC monitors the downlink C/I ratio on each super-reuse frequency of the regular cell separately for each ongoing call. The monitoring is accomplished in such a way that the BSC calculates the downlink C/I ratio of the super-reuse TRX by means of various parameters and by means of measurement results reported by the MS via the BTS. The BSC can calculate the C/I ratio on the super-reuse frequencies at the location of each active mobile station MS. The C/I can be calculated in this way; since the downlink transmits power is the same on the regular and super-reuse frequencies of the cell (col. 9, lines 21-37; col. 9, line 54- col. 10, line 31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Aalto to the communication system of Searle in order to improve frequency utilization in an under-overlay cellular radio network without increase in co-channel interference.

Regarding claim 12, Searle et al as modified discloses an antenna adjustment system (figs. 4-5), wherein the arranging means arranges the gathered information into a matrix (col. 6, lines 14-21;col. 6, line 65-col. 7, line 16; col. 8, lines 40-52).

Claims 13-14, contain similar limitations addressed in claims 8-11, and therefore are rejected under a similar rationale.

Regarding claims 15-18, Searle et al discloses a network element for adjusting antennas, comprising: gathering means for gathering information on interference in predetermined radio cells (col. 3, lines 31-40;col. 6, lines 33-50); arranging means for arranging the gathered information radio cell-specifically for processing (col. 4, lines 44-60); determining means for determining a tilting factor for at least one predetermined radio cell, wherein the tilting factor

relates to the interference that the radio cell produces to other cells (col. 7, lines 1-33; col. 11, line 38- col. 12, line 13).

However, Searle et al does not specifically disclose the features of searching means for searching for the radio cells having the antenna tilting factors that fulfill a predetermined criterion; wherein the information on the interference comprises pilot-channel signal-strength measurement results measured by user terminals.

On the other hand, Aalto et al, from the same field of endeavor, discloses a cellular radio network and a method for increasing traffic carrying capacity in a cellular network in which the operating frequency spectrum of the cellular network has been divided so that typically both regular frequencies and super-reuse frequencies are employed in each cell. The regular frequencies use a conventional frequency reuse pattern to provide seamless overall coverage. A very tight frequency reuse pattern is used for the super-reuse frequencies to provide additional capacity (col. 3, lines 24-61; col. 4, lines 8-37). The cellular network controls the division of traffic into regular and super-reuse frequencies by radio resource allocation at the call set-up phase and later on during the call by handover procedure. The cellular network continuously monitors the downlink co-channel interference of each super-reuse frequency in the cell separately for each ongoing call. The call is handed over from a regular frequency to a super-reuse frequency when the co-channel interference level on the super-reuse frequency is sufficiently low. When the co-channel interference level on the super-reuse frequency deteriorates, the call is handed over from the super-reuse frequency back to the regular frequency (col. 7, lines 1-27; col. 8, lines 5-29; col. 9, line 54- col. 10, line 31). Furthermore, the BSC controls traffic division into regular and super-reuse frequencies by means of radio resource

allocation at the call set-up phase and later on during the call by means of a handover. The BSC allocates a traffic channel to the call to be set up or to a call handed over from another regular cell at a regular TRX only, wherefore a regular cell must have at least one regular TRX, typically a BCCH TRX. The BSC monitors the downlink C/I ratio on each super-reuse frequency of the regular cell separately for each ongoing call. The monitoring is accomplished in such a way that the BSC calculates the downlink C/I ratio of the super-reuse TRX by means of various parameters and by means of measurement results reported by the MS via the BTS. The BSC can calculate the C/I ratio on the super-reuse frequencies at the location of each active mobile station MS. The C/I can be calculated in this way; since the downlink transmits power is the same on the regular and super-reuse frequencies of the cell (col. 9, lines 21-37; col. 9, line 54- col. 10, line 31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Aalto to the communication system of Searle in order to improve frequency utilization in an under-overlay cellular radio network without increase in co-channel interference.

Regarding claim 19, Searle et al as modified discloses an antenna adjustment system (figs. 4-5), wherein the arranging means arranges the gathered information into a matrix (col. 6, lines 14-21;col. 6, line 65-col. 7, line 16; col. 8, lines 40-52).

Claims 20-22, contain similar limitations addressed in claims 15-18, and therefore are rejected under a similar rationale.

Regarding claim 23, Searle et al discloses an antenna adjustment system (figs. 4-5) configured to: gather information on interference in predetermined radio cells (col. 3, lines 31-40;col. 6, lines 33-50); arrange the gathered information radio cell-specifically for processing

(col. 4, lines 44-60); determine a tilting factor for at least one predetermined radio cell, wherein the tilting factor relates to the interference that the radio cell produces to other cells (col. 7, lines 1-33; col. 11, line 38- col. 12, line 13).

However, Searle et al does not specifically disclose the step of searching for the radio cells having the antenna tilting factors that fulfill a predetermined criterion.

On the other hand, Aalto et al, from the same field of endeavor, discloses a cellular radio network and a method for increasing traffic carrying capacity in a cellular network in which the operating frequency spectrum of the cellular network has been divided so that typically both regular frequencies and super-reuse frequencies are employed in each cell. The regular frequencies use a conventional frequency reuse pattern to provide seamless overall coverage. A very tight frequency reuse pattern is used for the super-reuse frequencies to provide additional capacity (col. 3, lines 24-61; col. 4, lines 8-37). The cellular network controls the division of traffic into regular and super-reuse frequencies by radio resource allocation at the call set-up phase and later on during the call by handover procedure. The cellular network continuously monitors the downlink co-channel interference of each super-reuse frequency in the cell separately for each ongoing call. The call is handed over from a regular frequency to a super-reuse frequency when the co-channel interference level on the super-reuse frequency is sufficiently low. When the co-channel interference level on the super-reuse frequency deteriorates, the call is handed over from the super-reuse frequency back to the regular frequency (col. 7, lines 1-27; col. 8, lines 5-29; col. 9, line 54- col. 10, line 31). Furthermore, the BSC controls traffic division into regular and super-reuse frequencies by means of radio resource allocation at the call set-up phase and later on during the call by means of a handover. The BSC

allocates a traffic channel to the call to be set up or to a call handed over from another regular cell at a regular TRX only, wherefore a regular cell must have at least one regular TRX, typically a BCCH TRX. The BSC monitors the downlink C/I ratio on each super-reuse frequency of the regular cell separately for each ongoing call. The monitoring is accomplished in such a way that the BSC calculates the downlink C/I ratio of the super-reuse TRX by means of various parameters and by means of measurement results reported by the MS via the BTS. The BSC can calculate the C/I ratio on the super-reuse frequencies at the location of each active mobile station MS. The C/I can be calculated in this way; since the downlink transmits power is the same on the regular and super-reuse frequencies of the cell (col. 9, lines 21-37; col. 9, line 54- col. 10, line 31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Aalto to the communication system of Searle in order to improve frequency utilization in an under-overlay cellular radio network without increase in co-channel interference.

Regarding claim 24, Searle et al discloses a network element for adjusting antennas (figs. 4-5) configured to: gather information on interference in predetermined radio cells (col. 3, lines 31-40;col. 6, lines 33-50); arrange the gathered information radio cell-specifically for processing (col. 4, lines 44-60); determine a tilting factor for at least one predetermined radio cell, wherein the tilting factor relates to the interference that the radio cell produces to other cells (col. 7, lines 1-33; col. 11, line 38- col. 12, line 13).

However, Searle et al does not specifically disclose the step of searching for the radio cells having the antenna tilting factors that fulfill a predetermined criterion.

On the other hand, Aalto et al, from the same field of endeavor, discloses a cellular radio network and a method for increasing traffic carrying capacity in a cellular network in which the operating frequency spectrum of the cellular network has been divided so that typically both regular frequencies and super-reuse frequencies are employed in each cell. The regular frequencies use a conventional frequency reuse pattern to provide seamless overall coverage. A very tight frequency reuse pattern is used for the super-reuse frequencies to provide additional capacity (col. 3, lines 24-61; col. 4, lines 8-37). The cellular network controls the division of traffic into regular and super-reuse frequencies by radio resource allocation at the call set-up phase and later on during the call by handover procedure. The cellular network continuously monitors the downlink co-channel interference of each super-reuse frequency in the cell separately for each ongoing call. The call is handed over from a regular frequency to a super-reuse frequency when the co-channel interference level on the super-reuse frequency is sufficiently low. When the co-channel interference level on the super-reuse frequency deteriorates, the call is handed over from the super-reuse frequency back to the regular frequency (col. 7, lines 1-27; col. 8, lines 5-29; col. 9, line 54- col. 10, line 31). Furthermore, the BSC controls traffic division into regular and super-reuse frequencies by means of radio resource allocation at the call set-up phase and later on during the call by means of a handover. The BSC allocates a traffic channel to the call to be set up or to a call handed over from another regular cell at a regular TRX only, wherefore a regular cell must have at least one regular TRX, typically a BCCH TRX. The BSC monitors the downlink C/I ratio on each super-reuse frequency of the regular cell separately for each ongoing call. The monitoring is accomplished in such a way that the BSC calculates the downlink C/I ratio of the super-reuse TRX by means of various

parameters and by means of measurement results reported by the MS via the BTS. The BSC can calculate the C/I ratio on the super-reuse frequencies at the location of each active mobile station MS. The C/I can be calculated in this way; since the downlink transmits power is the same on the regular and super-reuse frequencies of the cell (col. 9, lines 21-37; col. 9, line 54- col. 10, line 31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Aalto to the communication system of Searle in order to improve frequency utilization in an under-overlay cellular radio network without increase in co-channel interference.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mao US Patent No 6154654 discloses a telecommunications system and method for a frequency re-use plan which reduces the adjacent channel interference between cells, while maintaining good co-channel interference in a four cell frequency reuse plan.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marceau Milord whose telephone number is 571-272-7853. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on 571-272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MARCEAU MILORD

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4-26-06